

WHAT IS CLAIMED IS:

1. A non-aqueous electrolytic solution comprising  
5 a non-aqueous solvent and an electrolyte, which further  
contains a nitrile compound and an S=O group-containing  
compound.
2. The electrolytic solution of claim 1, wherein  
10 the nitrile compound is a mononitrile compound.
3. The electrolytic solution of claim 2, wherein  
the mononitrile compound is acetonitrile, propionitrile,  
butylonitrile, valeronitrile, hexanenitrile, octane-  
15 nitrile, undecanenitrile, decanenitrile, cyclohexane-  
carbonitrile, benzonitrile, or phenylacetonitrile.
4. The electrolytic solution of claim 1, wherein  
the nitrile compound is a dinitrile compound.  
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5. The electrolytic solution of claim 4, wherein  
the dinitrile compound is succinonitrile, glutaronitrile,  
adiponitrile, 1,5-dicyanopentane, 1,6-dicyanohexane, 1,7-  
dicyanoheptane, 1,8-dicyanooctane, 1,9-dicyanononane,  
25 1,10-dicyanodecane, 1,12-dicyanododecane, tetramethyl-  
succinonitrile, 2-methylglutaronitrile, 2,4-dimethyl-  
glutaronitrile, 2,2,4,4-tetramethylglutaronitrile, 1,4-  
dicyanopentane, 2,5-dimethyl-2,5-hexanedicarbonitrile,  
2,6-dicyanoheptane, 2,7-dicyanooctane, 2,8-dicyanononane,  
30 1,6-dicyanodecane, 1,2-dicyanobenzene, 1,3-dicyano-  
benzene, or 1,4-dicyanobenzene.

6. The electrolytic solution of claim 1, wherein the S=O group-containing compound is dimethylsulfite, diethylsulfite, ethylenesulfite, propylenesulfite, vinyl-  
5 ethylenesulfite, dimethylsulfone, diethylsulfone, methyl-  
ethylenesulfone, divinylsulfone, sulforane, sulforene, methyl  
methanesulfonate, ethylmethanesulfonate, propargyl  
methanesulfonate, methyl benzenesulfonate, 1,3-propane-  
sultone, 1,4-butanedisulfone, dimethyl sulfate, diethyl  
10 sulfate, ethyleneglycol sulfate, or 1,2-propanediol sul-  
fate.

7. The electrolytic solution of claim 1, wherein the nitrile compound is contained in an amount of 0.001  
15 to 10 wt.%.  
8. The electrolytic solution of claim 1, wherein the S=O group-containing compound is contained in an amount of 4 wt.% or less.

20 9. The electrolytic solution of claim 1, wherein the nitrile compound and the S=O group-containing compound are contained in a weight ratio of 1:99 to 99:1.

25 10 11. The electrolytic solution of claim 1, wherein the non-aqueous solvent comprises at least one compound selected from the group consisting of a cyclic carbonate, a cyclic ester, a linear carbonate, and an ether.

30 12. The electrolytic solution of claim 1, wherein the non-aqueous solvent comprises a cyclic carbonate and a linear carbonate in a volume ratio of 1:9 to 9:1.

35 13. The electrolytic solution of claim 1, wherein the non-aqueous solvent comprises a cyclic carbonate and an ether in a volume ratio of 1:9 to 9:1.

14. The electrolytic solution of claim 1, wherein the non-aqueous solvent comprises a cyclic carbonate and a cyclic ester in a volume ratio of 1:99 to 99:1.

5        15. A non-aqueous electrolytic solution comprising a non-aqueous solvent and an electrolyte, which further contains a dinitrile compound in an amount of 0.001 to 10 wt.%.  
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16. The electrolytic solution of claim 15, wherein the dinitrile compound is succinonitrile, glutaronitrile, adiponitrile, 1,5-dicyanopentane, 1,6-dicyanohexane, 1,7-dicyanoheptane, 1,8-dicyanooctane, 1,9-dicyanononane, 1,10-dicyanodecane, 1,12-dicyanododecane, tetramethyl-  
15 succinonitrile, 2-methylglutaronitrile, 2,4-dimethylglutaronitrile, 2,2,4,4-tetramethylglutaronitrile, 1,4-dicyanopentane, 2,5-dimethyl-2,5-hexanedicarbonitrile, 2,6-dicyanoheptane, 2,7-dicyanooctane, 2,8-dicyanononane, 1,6-dicyanodecane, 1,2-dicyanobenzene, 1,3-dicyano-  
20 benzene, or 1,4-dicyanobenzene.

17. The electrolytic solution of claim 15, wherein the non-aqueous solvent comprises at least one compound selected from the group consisting of a cyclic carbonate,  
25 a cyclic ester, a linear carbonate, and an ether.

18. The electrolytic solution of claim 15, wherein the non-aqueous solvent comprises a cyclic carbonate and a linear carbonate in a volume ratio of 1:9 to 9:1.  
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19. The electrolytic solution of claim 15, wherein the non-aqueous solvent comprises a cyclic carbonate and an ether in a volume ratio of 1:9 to 9:1.  
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20. The electrolytic solution of claim 15, wherein the non-aqueous solvent comprises a cyclic carbonate and a cyclic ester in a volume ratio of 1:99 to 99:1.

5        21. A lithium battery comprising a positive electrode, a negative electrode comprising a carbonaceous material of a graphite crystal structure having a lattice distance of lattice surface (002) of 0.34 nanometer or less and a non-aqueous electrolytic solution of claim 1.

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22. A lithium battery comprising a positive electrode, a negative electrode comprising a carbonaceous material of a graphite crystal structure having a lattice distance of lattice surface (002) of 0.34 nanometer or less and a non-aqueous electrolytic solution of claim 14.

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